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RECORD OF ORAL HEARING

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS

AND INTERFERENCES

Ex Parte SUMIO IIJIMA *et al.*

Appeal 2010-003574
Application 10/560,808
Technology Center 1700

Oral Hearing Held: Tuesday, February 1, 2011

Before BRADLEY R. GARRIS, TERRY J. OWENS and MARK NAGUMO, Administrative Patent Judges

ON BEHALF OF THE APPELLANT:

MATTHEW JACOB, ESQ.
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The above-entitled matter came on for hearing on Tuesday, February 1, 2011, commencing at 10:35 a.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, 9th Floor, Alexandria, Virginia, before Kevin E. Carr, Notary Public.

THE CLERK: Calendar No. 4, Appeal No. 2010-003574, Mr. Jacob.

JUDGE GARRIS: Thank you.

Good morning, Mr. Jacob.

MR. JACOB: Good morning, Your Honors.

JUDGE GARRIS: Do you have a business card you could give our reporter, please?

MR. JACOB: Possibly. Just to help with spelling and what not.

What kind of lawyer is this? No business card, I don't see one here. I'm sorry.

JUDGE GARRIS: Oh, that's all right. I believe if you could just spell your last name?

MR. JACOB: Yeah, J-a-c-o-b, first name Matthew, M-a-t-t-h-e-w.

JUDGE GARRIS: All right, sir. As you know, you have about 20 minutes. Please begin.

MR. JACOB: I would request, if possible, an extra five minutes, because there's a lot of issues to discuss.

JUDGE GARRIS: Maybe not that many issues are necessary. But we'll play that by ear, and see how it goes.

MR. JACOB: Okay. Thank you.

Okay. So this is an appeal from the final rejection of Claims 6 to 9. The remaining claims 10 and 11 are withdrawn.

Main Claim 6 is directed to a single-wall carbon nanohorn. We're dealing in the area of nanochemistry and nanohorns, nanotubes, and fullerenes are the common nano materials that we deal with.

Anyway, this is a single-wall nanohorn, having methane absorbtivity, in which a lanthanide metal is deposited on the nanohorn.

A single-wall nanohorn is basically a carbon nanotube, that has a horn-like structure at the end of it. So if my arm is the tube, this would be the nanohorn. Just the arm alone would be the tube.

Fullerenes are basically BuckyBalls or spheres. This will come up in a few moments.

On pages one to three of the specification, it disclosed that our nanohorns are particularly capable of absorbing methane, in comparison to other carbon forms or allotropes, which are known to absorb methane.

The claimed lanthanide metal nanohorn, we show, is 50 percent better in methane absorption than the nanohorn without the lanthanum. And that's at page eight, lines 1 to 9 of the speculum.

Claims 6 to 9 were rejected under 103, as unpatentable over Kawamura US 6706431. Kawamura discloses that fullerenes, nanotubes,

nanohorns, nanofibers, and metal encapsulated fullerenes, alone or combined, form electrodes suitable to store hydrogen in a fuel cell.

As metals they mention platinum group metals and several others, but they really don't mention lanthanum, per se. This may be subject to debate, but looking at the Kawamura reference, lanthanide, lanthanum is not listed as a hydrogen-absorbing material.

And we would argue that it's not disclosed as part of a metal-encapsulated fullerene to be used in Kawamura's invention.

The first theory of the rejection is that since Kawamura discloses nanohorns and fullerenes, in other words, the sphere and the horn, and some others, and you can use them singly or combined;

So the first theory of the rejection is that if you have a mixture and you glue them together to form an electrode, it would cause the nanohorns and the metal-encapsulated fullerenes to contact each other.

Now the metal in Kawamura is inside, it's encapsulated in the fullerene. And you can see that from Kawamura, column 4, lines 48 and 49.

And it's not directly deposited on or available to directly contact the nanohorn.

Now our claim says that the lanthanide metal is deposited on the nanohorn. So what does deposited on mean? I guess you'd give it the broadest reasonable interpretation to one of ordinary skill in the art.

A lanthanide that is encapsulated by the fullerene is not available to be deposited on. It's within the fullerene. And I guess the Examiner is saying that it doesn't have to be deposited; if it contacts

somehow, even though it's separated within the fullerene, the metal is still deposited on the horn;

Which I think is contrary to what we say in our spec, and what any reasonable person skilled in the art in the field of absorption chemistry or nanochemistry would expect.

The board might want to take a look at MPEP 2111.01 on plain meaning. And we think that the Examiner's interpretation of "deposited on" is contrary to the plain meaning of the word.

Kawamura mentions carbon allotropes in combination; but he doesn't actually disclose a mixture of lanthanum metal-encapsulated fullerenes with carbon nanohorns.

So you need to pick and choose from among the many carbon allotropes disclosed by Kawamura and the many metals that can be within a metal-encapsulated fullerene to come to what the Examiner says, not what we have.

It's not what we have.

Kawamura does mention lanthanum-encapsulated fullerenes, such as lanthanum carbon 82 in column four, lines 37 to 49.

But it doesn't really appear that that's part of his invention. It's just some background explaining what a metal-encapsulated fullerene is.

So it takes a large stretch of imagination and hindsight to find or to single out from Kawamura a lanthanum deposited nanohorn with the lanthanum deposited on the surface of the nanohorn.

His next theory of rejection is that the nanohorn agglomerates when you mix the nanohorn, if you mix a nanohorn with a metal-encapsulated fullerene, it will somehow agglomerate, and there will be enough of the lanthanum peaking through the metal-encapsulated fullerene to be deposited on and interact with the nanohorn, because the Examiner says nanohorns have an open-caged structure, which would permit this.

Well, what proof does the Examiner present to support his theory about the openness of the structure of fullerenes? How open is the structure and is it open enough to permit the lanthanide encapsulated inside to peek outside and somehow contact the nanohorn, that it might be mixed with?

We think not.

The Examiner's theory is apparently based on inherency, but inherency according to MPEP 2112 states that it's insufficient data result may occur, it must occur.

And we don't see how it must be the case that the lanthanum, even if lanthanum is encapsulated within fullerenes, and even if it's mixed with nanohorns, that the lanthanum would be deposited in the fullerene, maybe deposited on the nanohorn.

We argue separately with respect to Claim 7, which requires a specific amount of lanthanum metal to be deposited on the nanohorn. The Examiner says it would be within the skill of the art to optimize the amount of the lanthanum metal, in order to optimize the catalytic effect of the carbon;

But we don't know what catalytic effect. I mean, we're dealing with absorbents, basically here. We want to absorb methane.

And how to achieve or enable this level of contact, when the metal of Kawamura doesn't even contact the nanohorn.

So in other words, you have this ball with the lanthanum inside, and perhaps it could be mixed with the nanohorn, and the metal inside will somehow peak out or somehow interact with the nanohorn.

So the metal is encapsulated in the fullerene, the sphere, and somehow if it's mixed with the nanohorn, might somehow touch it.

The Kawamura reference sheds a little light on that possibility of the structure being open enough to permit this contact.

Kawamura says in Column 4, starting at line 44, "The characteristic of fullerenes are known to produce doping alkaloid" -- I think they mean alkaline -- "metal between the frames of M3C60, where M is an alkaloid metal, such as potassium or rubidium" -- these of course, alkaline metals -- "and to encapsulate such metals as lanthanum and calcium in the form of compounds like LAC82, LA2C82, and C60."

So it appears that if there's anything peaking through the structure, it's a rather porous, open structure. But it's porous in relative terms, meaning very fine openings.

So if you have the sphere, the BuckyBall, with tiny openings, it's the potassium and rubidium alkaline metals that are in the interstices;

But the plain meaning of encapsulated is: Within. So it's the lanthanum that is totally within the fullerene.

So in Claim 9, we further require that the metal be lanthanum, the lanthanide metal be one of several actual lanthanide metals.

And as I said, there's no actual teaching of using LA, lanthanum, as a metal-encapsulated fullerene in Kawamura, and certainly not to contact the nanohorn disclosed by Kawamura.

In other words, there's many possibilities, many permutations and combinations, and it would take a great stretch of imagination and complete hindsight reconstruction of our invention to pull out lanthanide metal contacting a carbon nanohorn from Kawamura's disclosure.

So basically Kawamura is not even enabling for any particular amount of lanthanide metal being deposited on their carbon nanohorn; because it's trapped inside the ball, so how can you control the amount that's actually deposited on the nanohorn?

So it's a rather speculative interpretation, at best. And as we said, "deposited," we believe it means "contact." And that's the normal use of the word, and it doesn't mean buried in something else, which in turn contacts or may contact the carbon nanohorn.

So for the reasons I've given, I request a reversal of the exam as rejection.

And I guess I don't need that extra time.

JUDGE GARRIS: No questions? Any questions?

(Discussion was held off the record.)

JUDGE GARRIS: Sir, thank you very much for coming in, and helping us with this case.

MR. JACOB: Thank you.

(Whereupon, at 10:53 a.m., the proceedings were concluded.)

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